REPLACED BY ART 34 AMDT

Claims

1. Piezoelectric actuator (1) comprising

- a stack of a plurality of individual piezoelectric actuator elements (2, 2´, 2´´) which are disposed between inner electrodes (3, 3´, 3´´) and which contract or expand in a main oscillation direction (10) in dependence on an applied electric voltage,
- a first metallization strip (4) and a second metallization strip (5), the inner electrodes (3, 3´, 3´´) being respectively connected in an alternating manner to the first or second metallization strip (4) (5),
- a first outer electrode (6) and a second outer electrode (7) which are respectively fixed to the first or the second metallization strip (4) (5) in order to electrically contact the piezoelectric actuator (1) and
- a first connection element (8) and a second connection element (9) for externally contacting the piezoelectric actuator (1) which are respectively connected to the first or the second outer electrode (6) (7),

c h a r a c t e r i z e d i n t h a t

the outer electrodes (6) (7) comprise at least one region which is embodied in such a way that it compensates length variations of the piezoelectric actuator (1) in the main oscillation direction (10) as a result of its design and arrangement by means of elastic deformation exclusively inside a plane in each case which is parallel to the main oscillation direction (10).

2. Piezoelectric actuator (1) according to Claim 1,

c h a r a c t e r i z e d i n t h a t

the outer electrodes (6) (7) have a comb-shaped profile with contact teeth (11) (11´) to contact the metallization strips (4) (5).

3. Piezoelectric actuator (1) according to Claim 2, characterized in that the outer electrodes (6) (7) have a wave-form conductor plate (16) (16´) from which the contact teeth (11) lead away.

4. Piezoelectric actuator (1) according to Claim 2 or 3, characterized in that the wave-form conductor plate tapers along its principal axis (18) (18´).

5. Piezoelectric actuator (1) according to Claim 2, characterized in that the contact teeth (11) (11´) run parallel to each other and are all the same length at a first end (12) (12´) and the contact teeth (11) (11´) at this end (12) (12´) are soldered on the metallization strips (4) (5) for electric contact.

6. Piezoelectric actuator (1) according to one of Claims 2 to 5, characterized in that the outer electrodes (6) (7) are curved at an angle $\alpha < 90°$ in order to be fixed to the piezoelectric actuator (1), parallel to the first, straight end region (12) (12´) of the contact teeth (11) (11´).

7. Piezoelectric actuator (1) according to one of Claims 2 to 6, characterized in that the outer electrodes (6) (7) on the piezoelectric actuator (1) are fixed mechanically by means of an adhesive (14) to the

piezoelectric actuator (1) and the contact teeth (11) (11´) for soldering to the metallization strips (4) (5) are left clear when the adhesive (14) is applied.

8. Piezoelectric actuator (1) according to Claim 7,
c h a r a c t e r i z e d i n t h a t
the adhesive (14) is designed and arranged in such a way that electric insulation is ensured between the outer electrodes (6) (7) on the one hand and the piezoelectric actuator elements (2, 2´, 2´´) and the inner electrodes (3, 3´, 3´´) on the other hand.

9. Piezoelectric actuator (1) according to Claim 7 or 8,
c h a r a c t e r i z e d i n t h a t
the thickness of the layer of adhesive (14) between the outer electrodes (6) (7) on the one hand and the piezoelectric actuator elements (2, 2´, 2´´) and the inner electrodes (3, 3´, 3´´) on the other hand is determined by the admixture of particles of a preset size.

10. Piezoelectric actuator (1) according to one of the Claims 7 to 9,
c h a r a c t e r i z e d i n t h a t
the adhesive (14) is fuel-resistant.

11. Piezoelectric actuator (1) according to one of the preceding claims,
c h a r a c t e r i z e d i n t h a t
the piezoelectric actuator (1) is completely covered with adhesive (14).

12. Piezoelectric actuator (1) according to one of the preceding claims,
c h a r a c t e r i z e d i n t h a t

the outer electrodes (6) (7) are made from a bronze alloy using etching.